



23641

PATENT TRADEMARK OFFICE

Serial No. 09/584,570
Docket No. 28908/82353

IN THE CLAIMS

Please cancel Claims 40, 41, 42, 43, 44, 45, 46, 49, and 52 without prejudice or disclaimer of the subject matter recited therein.



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IN THE CLAIMS

Under 37 C.F.R. § 1.121(c)(1)(i), please rewrite Claims 1, 4, 6, 8, 12, 17, 19, 20, 21, 22, 24, 25, 26, 27, 31, 37, 39, 48, and 51, as follows:

A1

1. (Amended) A method of facilitating maintenance of a pump comprising the following steps:

- providing a pump including wear parts, a processor and memory;
- sensing at least one structural operating behavior of the pump indicative of the operation of the pump;
- generating operational data reflective of the sensed operating behavior;
- storing the generated operational data in the memory;
- storing parts identification data identifying wear parts of the pump in the memory;
- storing at least one predetermined level of operational information;
- operating the processor to compare the stored predetermined level to the stored operational data and in dependent response thereto outputting information as to the desirability of replacing or repairing at least one selected wear part.

A2

4. (Amended) The method of claim 1 wherein the pump comprises a pumping element and the structural operational behavior of the sensing step is a physical integrity of the pumping element of the pump.

A3

5. (Amended) The method of claim 2 wherein the pump comprises a check valve and the operational condition of the sensing step is a reverse fluid flow through the check valve.



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A4
8. (Amended) The method of claim 2 further comprising the following step:
operating the processor to compare the stored predetermined level to the
stored operational data and in dependent response thereto outputting information as to the
desirability of modifying the operation of pump.

A5
12. (Amended) The method of claim 1 wherein the pump comprises a
pumping element and the structural operational behavior of the sensing step is a temperature of
the pumping element of the pump.

A6
17. (Amended) A method of modifying an operation of a pump comprising
the following steps:
providing a pump, a processor and memory;
sensing at least one acoustical signal generating operating condition of the
pump indicative of the operation of the pump with an acoustical signature sensor;
generating operational data reflective of the sensed operating condition;
storing the generated operational data in the memory;
storing at least one predetermined level of operational information;
operating the processor to compare the stored predetermined level to the
stored operational data and in dependent response thereto outputting information as to the
desirability of modifying the operation of pump.

A7
19. (Amended) The method of claim 18 wherein the operational condition of
the sensing step is an output flow rate of the pump.

20. (Amended) The method of claim 18 wherein the operational condition of
the sensing step is a cycle rate of the pump.



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21. (Amended) The method of claim 18 wherein the operational condition of the sensing step is an acceleration of a cycle rate of the pump.

22. (Amended) The method of claim 18 wherein the pump comprises a pumping element and the operational condition of the sensing step is a temperature of the pumping element of the pump.

24. (Amended) The method of claim 18 wherein the pump is an air operated diaphragm pump comprising an air chamber and the operational condition of the sensing step is a back pressure in the air chamber.

25. (Amended) The method of claim 18 wherein the pump comprises at least one pumping chamber and the operational condition of the sensing step is a filling rate of the pumping chamber.

26. (Amended) The method of claim 18 wherein the operational condition of the sensing step is a suction pressure of the pump.

27. (Amended) The method of claim 18 wherein the pump comprises wear parts and the method further comprises the following steps:

storing parts identification data identifying wear parts of the pump in the memory; and

operating the processor to compare the stored predetermined level to the stored operational data and in dependent response thereto outputting information as to the desirability of replacing or repairing at least one selected wear part.

31. (Amended) A pump comprising:
at least one wear part, a processor and memory, at least one acoustical sensor for sensing at least one operating condition of the pump, and a display,



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A9
the acoustical sensor communicating operational data reflective of the sensed operating condition to the processor, the processor storing the operational data in the memory and updating the stored operational data upon receipt of new operational data from the sensor,

the memory also comprising parts identification data identifying wear parts of the pump and at least one predetermined level of operational information,

the processing comparing the stored predetermined level to the stored operational data and in dependent response thereto outputting information to the display as to the desirability of replacing or repairing at least one selected wear part.

A10
37. (Amended) The pump of claim 31 wherein the wear part is a check valve and comprises a sensor that senses a reverse fluid flow through the check valve.

A11
39. (Amended) A pump comprising:
at least one wear part, a processor and memory, at least one sensor for sensing at least one acoustical signal generating operating condition of the pump, and a display,
the sensor communicating operational data reflective of the sensed operating condition to the processor, the processor storing the operational data in the memory and updating the stored operational data upon receipt of new operational data from the sensor,
the memory also comprising parts identification data identifying wear parts of the pump and at least one predetermined level of operational information,
the processor comparing the stored predetermined level to the stored operational data and in dependent response thereto outputting information to the display as to the desirability of replacing or repairing at least one selected wear part modifying the operation of the pump.



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A12

48. (Amended) A method of facilitating maintenance of a pump comprising the following steps:

- providing a pump including wear parts, a processor and memory;
- sensing at least one acoustic signature signal of the pump indicative of the operation of the pump;
- storing the sensed signature signal in the memory;
- storing parts identification data identifying wear parts of the pump in the memory;
- storing at least one predetermined signature signal;
- operating the processor to compare the stored predetermined signature signal to the stored sensed signature signal and in dependent response thereto outputting information as to the desirability of replacing or repairing at least one selected wear part.

A13

51. (Amended) A pump comprising:

- at least one wear part, a processor and memory, at least one sensor for sensing at least one acoustical signature signal of the pump, and a display,
- the sensor communicating the sensed signature signal to the processor, the processor storing the signature signal in the memory and updating the stored signature signal upon receipt of a new signature signal from the sensor,
- the memory also comprising parts identification data identifying wear parts of the pump at least one predetermined signature signal,
- the processor comparing the stored predetermined signature signal to the stored signature signal and in dependent response thereto outputting information to the display as to the desirability of replacing or repairing at least one selected wear part.